

INSTRUCTIONS FOR WORKING  
GELATINE FILMS,  
AND THE  
100-FOLD FILMOGRAPH,

FOR TAKING  
FROM 1 TO 100 FILM NEGATIVES IN SUCCESSION,  
WITHOUT CUMBERSOME APPARATUS.



WITH  
PHOTOGRAPH FROM FILM NEGATIVE.



*"Soon as the Morn restored the Day -" (Odyssey)*

Went, lost, stol'n, or gone astray  
From the shelves of

**H. H. DAY.**

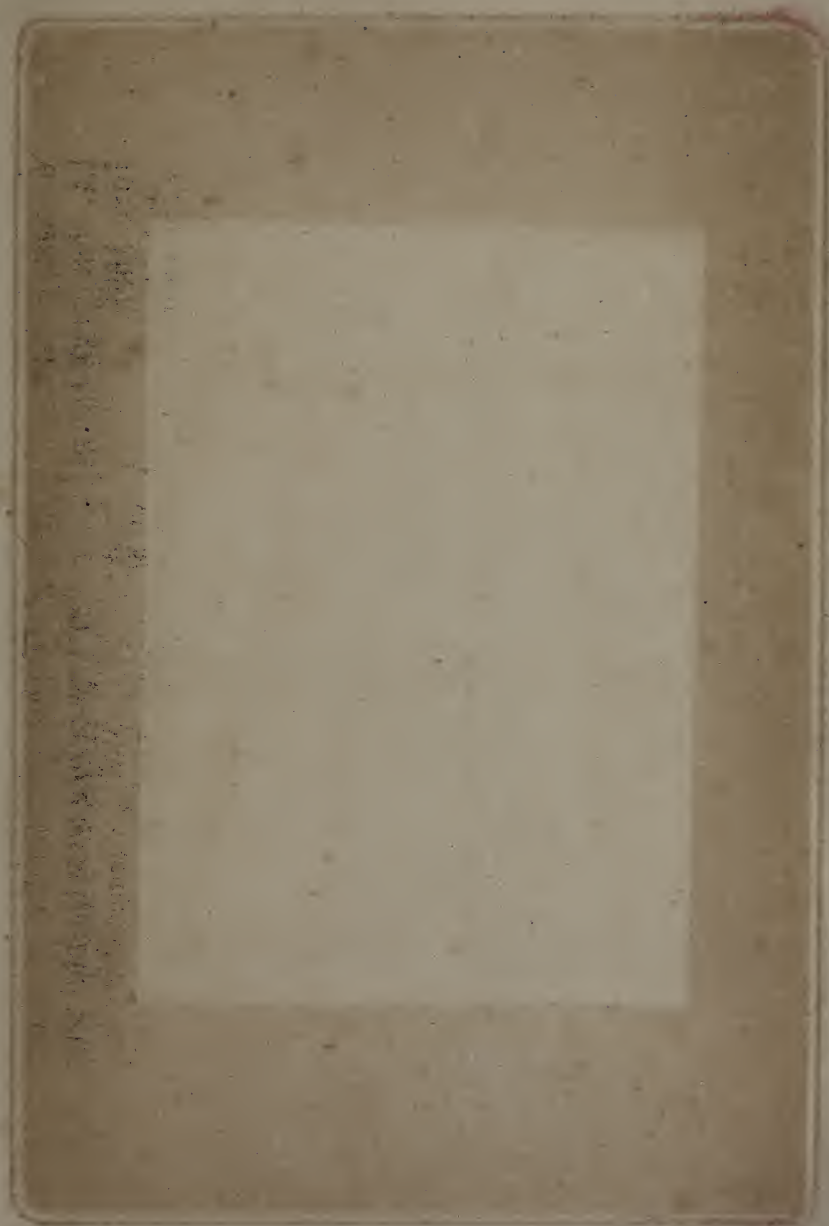
Please return - & that with speed -  
Other friends may wish to rede.

©  
RR

An average sample of a series of 70 photographs taken on Films,  
[A. Pumphey's Patent] by an Amateur during a continental tour,  
June, 1881.









PRICE SIXPENCE.

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INSTRUCTIONS FOR USING  
THE PATENT  
100-FOLD FILMOGRAPH,  
FOR TAKING  
FROM 1 TO 100 FILM NEGATIVES IN SUCCESSION,  
WITHOUT CUMBERSOME APPARATUS.



ALSO,  
INSTRUCTIONS FOR WORKING  
GELATINE FILMS.

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1882.





## PREFACE.

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PHOTOGRAPHY was, until within the last few years, a complicated art, requiring large experience, constant practice, and bulky and costly apparatus, to obtain good results. A revolution has taken place in the perfection of the dry processes, which were once considered by the professional photographer as only fit for the amateur who was content with second-rate results. The dry Gelatine process is now worked by all photographers of standing, in consequence of its much greater sensitiveness, and is *the* process of the day.

My patented improvements of the Gelatine process should do much to make the art of Photography more popular, as it reduces the weight of apparatus to one-eighth, so that the photographer can now carry a large stock of sensitive Films with little more apparatus than the artist who takes the sketching block, stool, and easel. The directions given are of a practical nature, which, if followed, will enable anyone with a little practice, to obtain good results.

A. PUMPHREY.





## OUTLINES OF THE PHOTOGRAPHIC PROCESS.

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**T**HE present method of practising Photography is a double one. A negative is first produced, and from that negative are afterwards produced any number of other photographs either on paper or glass.

It is with the first part of this process—the production of the negative—that we propose to deal in detail, saying enough of the latter to enable anyone to succeed.

**How the Negative is produced.**—The Patent Gelatine Films are sent out ready for use (and they will keep for an indefinite time if kept quite dry and in the dark). The Films are exposed to the action of light, which is reflected from any figure or view after passing through a lens, which brings the reflected light to a focus. The Film does not appear to be altered by this, which is called the Exposure.

**Development.**—The Film, after exposure to the light admitted through the lens, is subjected to the action of certain chemicals.

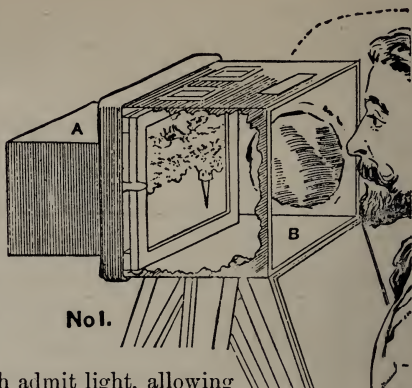
**Fixing the Picture.**—After the image is formed by the developer, the chemicals which were required to form the image are removed.

**Drying the Films and Varnishing** completes the process, which is neither difficult nor complex.

Before going further a detailed description of the apparatus will be given.

### DETAILED DESCRIPTION OF FILMOGRAPH.

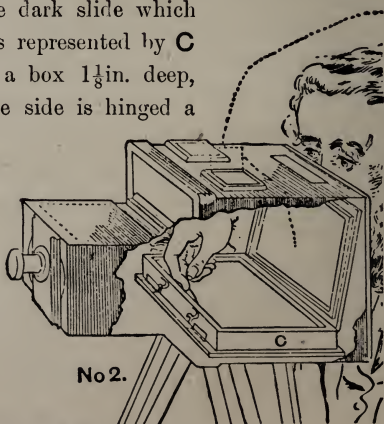
**Cut No. 1.**—**A** is the Camera opening into a changing box (**B**); the focusing glass and dark slide fit the end of the changing box, and are retained in place by a spring. At the top of the changing box (**B**) are three openings, two at the front with shutters covering two ruby glasses, which admit light, allowing



No1.

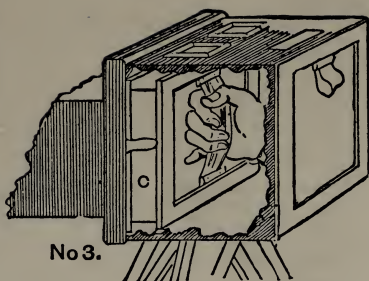
the operator to change the Films; the third, opening at the back, is the SIGHT, which allows the operator to see into the box. When in use, a hood, or dark cloth, clips the changing box and passes between the ruby lights and the sight (see also Cut 5). The object of two lights is to avoid sunlight striking on the Patent Films during the time of changing; if the sun is at the right hand of the operator the left hand ruby light is opened, and *vice versa*.

**Cuts No. 2 & 3.**—The dark slide which carries the sensitive Films is represented by **C** in each cut. It consists of a box  $1\frac{1}{2}$  in. deep, without any bottom; on one side is hinged a frame, the aperture of which is a little smaller than the size of the Film, and on the side at the opposite angle is hinged a door and handle. The frame side is represented as open in No. 2, in Cut 3 the back is seen with handle, and the operator is represented pushing it into the focus of the lens.



No2.

Attached to the side of the changing box is a sleeve made of light-proof India rubber cloth, this allows of the introduction of the right hand, which excludes all light entering by the sleeve (see Cut 5). The dark slide can be turned

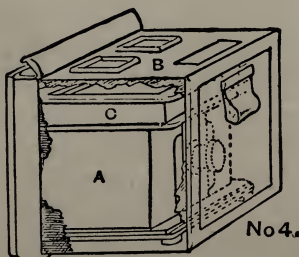


No 3.

over so as to present the front or frame side, or the door or back; these can be opened or shut at pleasure, and with the light which comes through the ruby glasses before mentioned, the Film can be transferred from the front to the back. The dark slide is filled in the following manner (in a dark room lighted with a small lamp having a ruby coloured shade): the dark slide is laid with front or frame side downwards, and the back is opened; on the inner side of the frame is laid a piece of card covered with black velvet, velvet side downwards, on this are placed as many Films as are desired to be carried (it may be any number, from 1 to 100,) or as many as the box will hold; on the top of these are placed a number of pieces of plain paper to fill up the box and to keep it light tight—the box is always sent out full of plain paper). When the box is closed the velvet covered card will keep the light from the Film, so that it may be carried in open light. In the case of desiring to use a single Film, it will be better to open the dark slide from the front, and simply insert the one Film. The apparatus is quite as well suited for a few as for many Films.

**Cut No. 4** represents the whole apparatus, packed. **A** is the Camera, **B** the changing box, **C** the dark slide; the ground glass is below the Camera, thus no room is wasted.

The Camera can be attached to the changing box, so as to take the picture upright or lengthways.



No 4.





Cut No. 5 represents the operator with dark cloth thrown round his head, and one arm introduced for changing the Film.

### METHOD OF MANIPULATING THE CAMERA.

When it is desired to expose a Film, the focus is first secured as in Cut No. 1, by introducing the ground glass, and securing the focus by the sliding adjustment shown in the camera (Cut 2), the ground glass is then withdrawn, the lens is capped to exclude the light, and the dark slide intro-

duced into the changing box. The dark slide must be placed the right side towards the lens, or it will open the wrong way; the side that goes first has three notches cut in it, thus



A dark cloth (indicated by the dotted line in Cuts No. 1 and 2), is attached to the camera by thick elastic, and is drawn over the head so as to exclude all light, the operator looking through the sight in the top of the changing box (as in Cuts 2 and 5). Ruby light is admitted by the two lights at the top.

The operator introduces his right hand and opens the box, takes out the velvet-covered card, and lays it on the bottom of the

camera, he then takes out a Film and lays it upon the card, and lifts both back into the dark slide with the Film outside, the card serving the purpose of preventing the Films underneath being affected by the light, the exposure is then made after the dark slide has been placed in focus, the hand is withdrawn, the cap of the lens removed, and replaced after the required exposure has been made.

After the Film is exposed, the hand is inserted, the head put under the hood, and the dark slide laid flat on the bottom of the changing box, the Film which has been exposed is withdrawn from above the card, it is placed in the bottom of the camera, the box is turned over, and the exposed Film put in at the back of the dark slide ; all this is easily done with one hand, and it takes less time to do than to describe. The process can be repeated till the paper packing is reached, when it will be evident that all the Films are exposed. There is no chance of a mistake being made between the exposed and unexposed Films.

The first thing which a learner should do is to endeavour to understand the instrument he is going to use ; to learn what exposure any subject will take ; and if the pictures he has taken, or may take, are overdone or underdone.

The Films are very sensitive to light, and are often called instantaneous ; but instantaneous pictures can only be taken of some subjects, and they are not the class of subjects to learn upon, as, in the most practiced hands, they are a matter of chance rather than certainty.

## TO SET THE CAMERA, AND EXPOSE THE FILM.

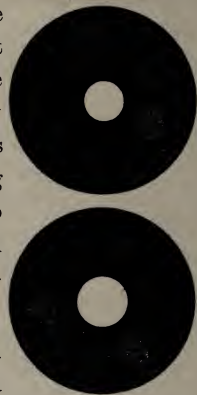
Set the stand, and camera upon it, of such a height that the operator looks easily into the sight at top of the camera, represented in Cut 2. Draw out the camera, slide it into the front, as in Cut No. 1, and place the ground glass as represented. Expose on some subject close at hand, such as a brick wall at not more than two yards' distance, in the shade, without sunshine or any sky in the field, such a subject will not be likely to be too quick. Take out the diaphragms or stops from the front, or from between the lens,

and obtain the best focus possible, then put in the smallest stop. It will be observable that with the diaphragms out more light is reflected than when the small stop is inserted, also that all parts cannot be obtained in equal definition without the small stop in.

It is impossible to give any positive rule for exposure, but begin with an exposure of ten seconds, and increase it ten seconds at a time ; refer to the instructions for "development."

There is no need to use a full-size Film to make these trials ; a bit of wood put in the front of the dark slide, and a piece of Film an inch square fastened upon it, will do to learn on. The velvet card can be put in to cover up the small pieces as well as the larger.

**Diaphragms or Stops.**—The use of these is to regulate the amount of light : if an object is desired to be taken quickly, the largest possible stop should be used ; it is desirable to know exactly how much one stop admits more or less than another. This is obtained by calculating the squares of the diameters, thus, in the two represented at side, one is  $\frac{3}{16}$ , the other  $\frac{4}{16}$  of an inch in aperture, thus  $3 \times 3 = 9$ ,  $4 \times 4 = 16$ —the estimated speed will be as 9 is to 16.



The same will hold good as regards the speed of lenses, the shorter the focus of the lens and the smaller the picture, the quicker it will be ; thus a lens 6-inch focus as compared to an 8-inch, will be  $6 \times 6 = 36$ ,  $8 \times 8 = 64$ , or as 36 is to 64. This will explain why small pictures are recommended for instantaneous work.

**Lenses.**—For landscape work, or out-door groups or portraits, there is nothing better than what is known as the Achromatic Single Lens ; it gives a brilliant evenly-defined picture, provided a small stop is used. If this lens is used for architectural views, or for copying pictures, it will be found to give a slightly distorted figure. If a single lens is used for copying a rectilinear figure like **A**, it will reproduce it barrel-shaped like **B** ; this is objectionable in copying engravings, etc., but it does not show in an ordinary

view unless the object is very close to the lens. This lens will only work satisfactorily with using small stops or diaphragms. No two lenses are exactly alike, and the operator should try his lens with different apertures. The field which a single Achromatic lens gives is small for its focal length.



A



B

**Compound Lenses.**—The slight distortion mentioned may be overcome by the use of these lenses, a larger aperture can be used, giving crisp definition on a few points only; or, as with a single lens, perfect definition at all distances by using the small aperture. They are also made to include a much larger angle, so that views can be taken in confined situations, and the lens lifted out of centre so as to take the tops of lofty buildings. There are many varieties of compound lenses, the kind to which reference is made, and the only kind which is recommended, is known as “The Doublet.”

#### CONSIDERATIONS IN REGARD TO EXPOSURES.

The learner will, we hope, pardon our dwelling so much on the details of lenses and exposures, but they are the stepping stones to success; the difficulties of chemical combinations are things of the past, and as more depends upon judgment in giving correct exposures than anything else, we will mention a few things which will have to be borne in mind. Suppose an open view of houses, with half the picture sky, took three seconds on a bright sunny day, and after doing it the operator turned round and took a group of ferns as large as possible, these would require possibly 60 or 100 times the exposure of the open view, although done on the same day and in the same light; or the interior of a church lit



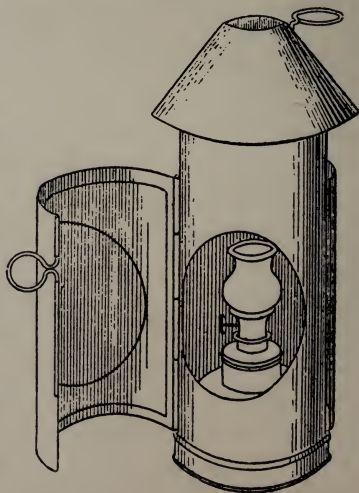
by a few small windows, may need 100 or 500 times the exposure required at the same time for the outside view. Again, the time of day and of year have much to do with a proper exposure, besides the difference of days and subject.

All this will show how desirable it is that more than one exposure should be made of any object about which any doubt is felt as to the right time of exposure, and this the 100-fold camera facilitates.

**The Dark Room.**—The light must be of a suitable non-actinic kind, either daylight admitted through two thicknesses of coloured glass, one ruby and the other orange, or else the room must be quite dark, and a small light with coloured glass shade used. All light will affect the Films if continued long enough, and the operator should cut up part of a Film into small pieces, and expose at different distances from his light, keeping one piece unexposed, then developing all together. He will then learn how much light he may use.

A small lamp with coloured shade is on the whole better to work with than daylight, as it does not vary so much. Before the Film is exposed keep the light as far from the unexposed Films as possible consistent with seeing what is done, and expose them as short a time as possible even to the coloured light. In development (as after described), as soon as the solution **A** is poured on the Film, bring the lamp with coloured shade close to the developing dish, as the sensitiveness is gone as soon as the Film is wetted with this solution; if this is not done the development will be a matter of chance instead of being directed by the intelligence of the operator.

The Lantern recommended is lighted with a small lamp, which is lifted out from the





top, and on each side is a sheet of coloured gelatine; one side is made a deeper colour than the other, the lighter colour to be used towards the end of the development, &c.

**Development.**—The plan recommended is that in which glycerine is used to preserve the pyrogallic acid, and as a restrainer.

Make two stock solutions, and label them No. 1 and No. 2.

No. 1.				No. 2.			
Pyrogallic Acid	...	...	1 oz.	Bromide of Potassium	120 grains.		
Methylated Alcohol	...	...	6 oz.	Water	...	...	6 oz.
Glycerine	...	...	1 oz.	Strong Ammonia (880)	...	...	1 oz.
Mix the Glycerine and Spirit, and add to the Pyro.				Glycerine	...	...	1 oz.

They will keep for months if well corked.

To make the developer, add one part of No. 1 to fifteen parts of ordinary water, and label this bottle D (Developer); in another bottle mix one part of No. 2 with fifteen parts of water, and label A (Accelerator). It will be found convenient, to avoid mistakes in the imperfect light of the dark room, to have these two bottles of different shapes. Either of the solutions will keep two or three days, but they are better mixed fresh every day. When it is desired to develop a Film, pour into a clean measure half-an-ounce of A for a Film measuring  $3\frac{1}{4} \times 4\frac{1}{4}$  in. (and in the same proportion for larger sizes), lay the Film in the bottom of a shallow dish, pour the solution on the surface of the Film, and with the finger, or a soft brush kept for the purpose, sweep the whole surface, allowing the solution to remain a minute or two on the Film; then measure an equal quantity of D, pour the solution A into the measure along with D, which then return to the Film in the dish; in a few seconds the image will appear, and, if the exposure has been well-timed, all the details will be out and the development complete in about one or two minutes. Do not hurry the development, but allow the Film to remain in the solution (after all the details are visible, until the required density is obtained; with these Films and the above developer there is no danger of fog except from light or over-exposure.

In order to see if the requisite amount of density is obtained, take the Film from the dish and hold close to the lamp; if not

strong enough, measure half the quantity of A first used, and add to the developer; the development may be carried on until there begins to be a deposit on those parts of the Film which have not been exposed to the light, viz., the parts held in the camera outside. There should be no need of further intensification, but any of the ordinary methods may be used with the Films the same as glass. It is most desirable to test the negatives by actually printing from them, as they print much stronger than they look.

Equal parts of A and D give the best result, with a rapid exposure, but any slight error of over-exposure may be rectified in the following manner; if, on application of the mixed developer the image flashes out, and the details in the shadows appear too quickly, it is an indication that the Film has been over-exposed; therefore *at once* throw off the mixed developer, and without stopping to wash the Film, flood it with D alone, when the development will be checked, and will proceed more slowly, while the image gains in density. If the image appears too slowly, or the negative appears to be getting too intense, add a very little A (there will, however, usually be sufficient of the latter left in the Film, with the simple addition of a sufficient quantity of D) to complete development. A very little experience will enable the operator to produce a good printing negative from a Film which, if developed with the full proportion of A, would have been utterly useless from over-exposure.

On the other hand, if on applying the mixed developer to the exposed Film, the image appears very slowly, showing only the high lights with but little detail in the shadows, the Film has evidently been under-exposed, and more A must be added at once. This may be done by pouring the A direct into one corner of the developing tray, and rapidly mixing with the other solution: care must be taken not to add too much A, or push this second development too far, or the negative will be fogged in the shadows, owing to the general reduction of the silver throughout the Film. If the Film be not too much under-exposed, the above treatment will be all that is required; a very much under-exposed Film will never yield a good printing negative; it is better to try again. With fairly-timed exposure, and the above method of development, each

Film may be depended upon to give a good printing negative requiring no intensifying.

The developer may be varied by increasing the amount of ammonia, or bromide of potassium, the former increasing the speed, and the latter decreasing it; but as it is not practicable to alter the developer very much to each picture, the proper way is to adapt the exposure to the developer.

**Indications of an Under-exposed Picture.**—The picture appears slowly when equal parts of A and D are used; the parts which come out are those only which are strongly lighted, and the shadows remain clear, except with a considerable addition of A, or with long continued developing.

**Indications of an Over-exposed Picture.**—The picture comes out immediately, the shadows and high lights appearing together, no parts remain clear even when D is made to replace A, and the whole remains flat and will not strengthen into a good picture.

**To obtain greater density.**—If the operator has any difficulty in getting sufficient density, let him alter the proportions of D, and instead of putting 1 to 15 of water, put 1 to 8; in that way any density can be secured.

**Fixing the Negative.**—Make a saturated solution of hypo-sulphate of soda in cold water, place this in a flat dish, *and as soon as the development is complete without any washing, place the Film face uppermost in the hypo-sulphate solution, and with the hand rub lightly, to cause the solution of hypo-sulphate of soda to rapidly displace the developer; this is a much better plan than attempting to remove the developer by washing.* When all the yellow unreduced bromide of silver is dissolved, pass into a saturated solution of alum. The fixing or the removing of the unaltered bromide may be done in a stronger light than the development; the light of an ordinary candle or lamp will not affect the results. It may be done in daylight, but this is best avoided, as such an exposure produces a delicate pink tint over the shadows of the negative, by reducing a little of the bromide.

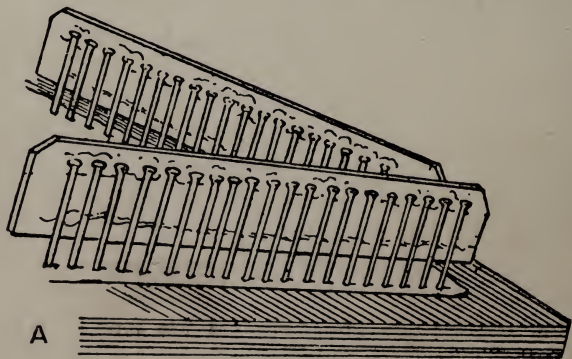
**Washing the Negative.**—This was formerly a tedious process, as unless the solution of hypo-sulphate of soda was

removed the negative faded. This is obviated by using a saturated solution of common alum following the hypo-sulphate—this it either removes or alters. The Film should be placed in the alum, giving a gentle rubbing with the hand on its introduction, allowing it to remain there ten or twelve minutes; a further washing in running water or several changes in the course of a quarter of an hour, and the Film will be ready to dry, and may be depended upon to be permanent. The whole process of development, fixing, and washing should be complete in a little over half an hour.

**Manipulation in Development, &c.**—The negative is formed in, not on the Film, it may therefore be handled as before described. It should not be simply put in the solution, and left to its fate, but gently rubbed on the surface; this will overcome any tendency to curl or come to the surface of the solution, and at the same time equalize the chemicals on the Films.

**Remarks.**—The hypo-sulphate solution sometimes darkens after a day's constant use, in that case replace it with fresh, as a dark-coloured solution discolours the Film. Do not use the alum solution very long, as it will accumulate matter from hypo-sulphate; use fresh every day. It is desirable to use saturated solution of alum and hypo-sulphate, as the both have a constricting action on gelatine.

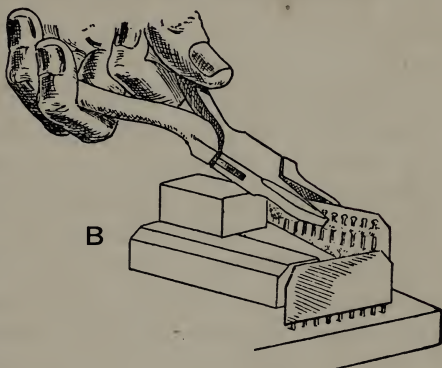
**Drying the Films.**—Without special care the Films when dry would be useless, as they would not dry flat. After a little drying with a cloth or between paper, to absorb any surface





moisture, all that is required is to pin them on a board to dry, but pins pushed in with the fingers are not firm enough, nor is it easy to put them close enough to each other.



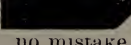
The best method is to have pins soldered to a piece of tin in lengths of an inch or so, and placing the Film on a soft pine board, with a light hammer drive the pins into the wood at least a quarter of an inch, as in sketch **A**. Pins which are driven in as firmly as this, are not easily withdrawn by the hand without a jerk, when there is a danger of tearing the Film if it adheres to the pins. A good plan is to use a block like **B**, using it as a fulcrum, holding it down steadily and closely to the pins, and with the other hand drawing the pins steadily with a pair of pliers as a lever.




**Another method of Drying.**—Take a sheet of glass two inches larger than Film, cut a

piece of blotting or soft paper the size of the Film, lay this on the glass, and the Film on the paper, then with a strip of gummed paper three-quarters of an inch wide, fasten the whole to the glass, making the paper attach to the Films one-eighth of an inch, and the rest to the glass.

The method with pins is the more economical in the long run, but with gummed paper it can be done almost anywhere. In either case the whole should be allowed to dry spontaneously.

**To determine the Sensitive or right side of the Film.**—This is the side which has the least polish or glaze upon it, but as this is not easily determined in a low or coloured light, they are marked as follows: the lower right-hand corner is cut as this, and no matter how the Film  is turned about, if the corner which is cut is placed  at the right-hand lower corner, for horizontal pictures  or at the right hand top corner for upright pictures, no mistake can occur.



When  the negatives are taken from the boards or glass they should be trimmed with a pair of scissors, to take away any part which has contracted outside the pins, or to remove the extra thickness of paper; it is well then again to cut the right-hand corner as above, as in printing for any purpose, either on paper or glass, the right side is seen at a glance.

**Varnishing.**—This should be done before the Film is removed from the boards or glass. It is easily applied cold with a brush, and then placed before the fire to dry quickly. If negatives are not varnished they are easily spoiled by coming in contact with silvered paper which is not absolutely dry.

**Development with Iron.**—We have already given the method which we consider best, but the following plan is preferred by some; it will answer for the Films. Make a saturated solution of protosulphate of iron in hot water—for a pint it will take about 12oz.; also make a saturated solution of neutral oxalate of potash—it will take about 8oz. to a pint of water. These two solutions will keep indefinitely. Make also a solution of bromide of potassium, 30 grains to the ounce of water. It is desirable to test the solution of neutral oxalate of potash with blue litmus test paper, and if it is positively alkaline and the solution does not turn the blue test paper slightly red, a few grains of oxalic acid must be added till it shows a slightly acid reaction. To use these solutions, mix immediately before using two parts of oxalate solution to one part of iron, adding the iron to the oxalate, and if it does not develope quite clean add one drop of the solution of bromide of potassium to each ounce of mixed solution; the mixed solution soon decomposes. It is best to mix a fresh lot for each Film. The advantage of this developer is that the action can be continued much longer than with the pyrogallie solution, as it does not turn the Film a dark colour, and any strength can be secured by continuing the action, if the Film is not over-exposed. The disadvantage is that it cannot be as easily adapted to the exposure as with pyrogallie acid and ammonia. The remaining manipulations are similar to those described as following the other method of development.

**Intensification of the Negative.**—Sometimes the resulting negative is not strong enough to print a bright picture, although there may be plenty of detail. The plan given below is we believe the best, although it will be much better to secure the proper density at once, as there are objections to intensifying, for it prolongs the operations, and it is uncertain whether the results are permanent, as the negatives often fade after the process.

### SOLUTION FOR INTENSIFYING.

#### No. 1.

Bichloride of Mercury	-	-	-	-	-	90 grains.
Bromide of Potassium	-	-	-	-	-	90 „
Water	-	-	-	-	-	12 oz.

#### No. 2.

Cyanide of Potassium, Pure Crystallized	-	-	-	-	-	40 grains.
Nitrate of Silver	-	-	-	-	-	45 „
Water	-	-	-	-	-	12 oz.

This solution should contain an undissolved precipitate of flaky cyanide of silver.

After the negative is dry, but before it is varnished, place it in No. 1 solution until the proper density is obtained; the limit is reached when the whole of the white is through to the back. It is then laid in No. 2 solution, which gives a dark colour to the Film. If the negative remains too long in No. 2, the deposit is attacked and the density reduced; after that it must be washed, and strained to dry, as if only just developed.

### NOTES REGARDING TAKING NEGATIVES.

**The Foreground Adjustment.**—The camera should never be pointed up or down, but kept at a true level, if this is not done distorted figures will be produced, similar to *G* if pointed upwards, as *H* if pointed downwards.



Each instrument is provided with a sliding front, which allows of the lens being moved a long way out of the centre; this is placed on a rotating plate, so that the alteration can be made in any way, should the camera be used lengthways or upright.

Remember that light is the forming power, but if it get to the Film before exposure it may destroy the image, therefore every care should be taken to prevent this, such as carrying the dark slide containing the Film in a black bag or one of Turkey red cloth.

Besides a right exposure, there is a right time to take every picture; for landscape work sunshine is always an advantage; to produce the best results there should be play of light and shade; this is best secured when the view is lighted obliquely, it is very seldom that views can be taken with the light in front of the operator, it should be behind the operator.

As regards the most suitable weather for taking Photographs, I reprint a letter just published in the *British Journal of Photography*, by a most experienced photographer:—

#### SUNSHINE OR SHADE?

*To the EDITORS.*

GENTLEMEN,—In glancing through THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, just published, I notice that Mr. W. Harding Warner makes the remark that bright sunshine in most cases is destructive to the working of a gelatine plate, and he intimates that more detail and finer pictures may be obtained on dull and cloudy days.

Surely Mr. Warner must be trying to pass a practical joke on his readers, or he can have had no knowledge of landscape photography. If he has examined the works in gelatine recently exhibited by many of the best photographers he will find that all the most successful pictures have been obtained in sunlight. I can also say that in my own experience of some twenty-five years I have seldom taken a landscape on a dull or cloudy day. Close studies, certainly, may be taken; but extensive views without the bright, crisp sunlight I should esteem a failure. If I ever venture out on a cloudy day to take a view I arrange my camera ready, take a comfortable seat on the nearest convenient spot, and wait till the sun makes its appearance, which may be, and has been many times, from minutes to hours; and, in the event of its not doing so till the day is too far advanced or my patience has been exhausted, I simply pack up, and, as Jacob Faithful says, look for “better luck next time,” and return on some future occasion.

Dull days, when the sun is not shining, may be profitably employed in selecting the views to be taken when the weather becomes favourable. On such occasions one should carry a compass, and also make a note of the time of day when the light is most suitable for taking the various views.

I have been induced to make these remarks, as they may be of service to the inexperienced. With the compliments of the season,—I am yours, &c.,

*December 27, 1881.*

WILLIAM ENGLAND.

The foreground of a photograph always tells for more than the extreme distance, therefore pay attention to make this a pleasing combination.

Always wipe the lens to remove dust or moisture in a damp atmosphere; it is better warmed, to prevent moisture settling,—this may be effected by being put into a pocket for half-an-hour before use, to gain a few degrees of heat from the body.

**Tripods.**—A steady tripod is an essential to good work; they are made in three sizes, of the alpenstock form, so as to be convenient to carry.

One size makes a staff  $1\frac{1}{8}$  in. diameter, and weighs 1lb.

Another „ „  $1\frac{3}{8}$  in. „ „  $1\frac{1}{2}$  lbs.

Another „ „  $1\frac{5}{8}$  in. „ „ 2lbs.

If the extra weight is not objected to, the strongest is the steadier.

Where a number of Films are to be exposed, it would be well to number each, this can be done with ordinary black ink, on the edge of the Film, which is covered by the frame, and if a record of the exposure which is given to each be kept, it will make the development much more certain.

## TO PRINT FROM THE FILMS.

We recommend the ready sensitized albumenized paper, which is now an article of commerce; it will keep good either before or after exposure for some weeks or months.

The Film is placed in a printing frame having a stout glass, and under the Film the sensitive paper, it can then be placed out of doors or close to the window till the light has passed through the negative and formed a picture; the longer it is exposed the darker will be the picture. It generally requires a trial or two to tell the



amount of printing each negative requires, but in all cases the printing must be darker than the final result desired, as the fixing process reduces the depth of colour.

**To Fix and Tone the Print.**—At any suitable and convenient time the picture can be fixed, if it has been preserved from the further action of light. In an earthen dish filled with water introduce the pictures one at a time, so that each may get wet all over and not adhere to its fellow. The water will at once become milky from the silver on the paper, and they must be moved about and the water changed till this milkiness disappears, which it will do with about five minutes' washing. Do not carry this washing on too long, as the pictures tone much better and more easily with a small trace of silver in the paper, not on the surface. Do not wash more pictures at one time than will cut out of one entire sheet of paper.

Have ready the following : A solution of chloride of gold—15 grains to 2 oz. of water. *This will keep.*

A stock solution of lime water, made by adding two or three lumps of unslacked lime to three or four gallons of water, and allowing it to stand till the water becomes clear ; store this in a clean bottle. Also have at hand a book of blue litmus test paper.

When the prints are washed, measure 1 drachm of the gold solution into a measure, insert a piece of test paper, it will at once turn red ; now add as much of the lime water as will overcome the acid reaction and turn the paper blue again. A little excess of lime water will do no harm ; add water to make the lime water and gold up to 6 or 8 oz., place this in a clean earthen dish, and place the prints one at a time in this solution, keeping them turned over, they will soon begin to change colour from a brick-red colour to a warm purple. The longer they are left in this solution the darker they will become ; at the same time a reducing action takes place. The temperature of the water or room effects the process ; if it goes on slowly, place the dish containing the prints in warm water, or on a stove or warm tile, &c.

This process is much more economically done where a number are toned together. Remove the prints which turn dark into



another pan of clean water, and, if they are slow in toning, proceed to wash another lot of pictures equal to the last; measure 1 drachm of gold solution, neutralize, but do not add more water than sufficient to make up 4 oz., add this to the first lot, and turn over the prints already in the toning, then add the other prints, and so on, till all are toned, and placed in clean water.

When all are toned make a solution of 3 oz. of hyposulphate of soda in 20 oz. of water, insert the prints, a considerable number at one time, in this solution, and keep turning them over, they will go at first to a most disagreeable yellowish red; they must be kept in this solution for ten or fifteen minutes; if any are too much printed they may be put into a saturated solution of hyposulphate of soda to reduce them. From the hyposulphate they are moved into clean water, and should have at least twelve hours washing in running or frequently changed water.

**Caution.**—Most of the paper which is sold ready prepared has an acid reaction, and this will sometimes overcome the alkaline tendency of the lime water, therefore keep a small piece of the litmus paper floating in the toning, and if it begins to redden add some lime water, the process of toning is certain to stop if the solutions become *acid*.

Care must be exercised to keep the hyposulphate solution from the washing and toning dishes, or of carrying any of the solution on the hands to the prints in the process of washing or toning, as ever so small a quantity causes stains, and stops the toning. In moving the toned prints into the hyposulphate solution, do not take one at a time, as for washing, but take a number at once, so that there may be few dips into the plain water.

**Printing by Artificial Light.**—The method already given produces the most pleasing results as regards colour, but the following has the great advantage that quite independent of daylight any number of pictures can be produced. The chemicals employed are the same as those used on the Films, only the prepared gelatine is spread upon paper. The requirements are: Prepared sensitized paper, which must be carefully stored in a dry place, protected from any light. For development use the chemicals as described

on page 18, viz. : saturated solution of protosulphate of iron, and saturated solution of neutral oxalate of potash, tested, as before described, to see if it is alkaline, and the addition of oxalic acid till an acid reaction is produced.

Place the prepared paper in a printing frame, as for the ready sensitized albumenized paper, taking care to screen the paper as much as possible while placing it in contact with the negative—this should be done in a darkened room, using a ruby lamp. So arrange your light for printing that you may always have an equal power of illumination, and have a fixed distance, carefully marked and measured, at which to place the printing frame for exposure. This will enable you to repeat a correct result, once obtained, as often as you may desire.

**The Light for Printing.**—A good paraffin lamp, where gas is not available, serves well. It must not, however, be supposed that a short exposure to a strong light will give the same results as a long exposure to a weak light. A dense negative requires a penetrating light. Whatever exposure you may give with a weak light, you will have a hard print, deficient in half tone ; but, on the other hand, if a thin negative is printed by a too powerful light, the result will be a poor flat image. It is important also to remember that the power of light decreases according to the square of the distance from the source of light. Thus, by making the distance between the printing frame and the light twice as great, the power of the light is diminished four times, and by making the distance three times as great, its power is diminished nine times, and so on. This rule should be kept in view when regulating the light to suit the character of your negative.

**To Develope the Paper Print.**—Place the paper in a dish of water (face downwards). Let the dish be as near the size of the picture as convenient. Leave it to soak while mixing your developer. When ready, turn the paper face upwards, drain off the water, and then flow on the developer. If the exposure has been correct, in about half-a-minute the picture will slowly appear and gradually gather strength, and exhibit all the details in about three minutes. But the rapidity of development

depends much upon the temperature ; it will be much quicker in warm weather. As soon as the picture begins to appear, you may use all the ruby light at your command to examine the progress of development. It must be remembered that the shadows do not appear in their full force under the developer ; they blacken in fixing, and allowance must be made for this. When the picture has gained full strength give it a slight wash, and fix in a solution of hyposulphate of soda, about 1 oz. to 6 oz. of water. In two or three minutes this operation is complete. Again wash the print thoroughly, and then immerse it for a few minutes in a saturated solution of common alum. Now take it to the daylight, and if the exposure and development has been correct, you will see a fine, rich, vigorous picture, full of half tone and of an agreeable neutral tint ; but if the picture has been under-exposed, the lights will be chalky and the shadows inky. If over-exposed, a flat grey image will appear, destitute of contrast. If the picture flashes out too quickly, dash off the developer, and flood with a weak bromide solution, then proceed again in the usual way. After fixing and thoroughly washing, give it a bath of acidulated water, 1 oz. of sulphuric acid to two quarts of water. A few minutes in this will clear up the lights and dissolve away a slight discoloration from the developer. After a few changes of water, the picture can be dried and rolled in the usual manner. Enamelling gives a rich, transparent appearance, and may be easily accomplished when wet by squeegeeing the print direct upon a collodionized plate, and proceeding by the usual method. A very agreeable flesh tint may be imparted to the prints by immersing them for a few minutes in a solution of aurine. A few grains of aurine, dissolved in a few drops of dilute ammonia, will colour a quart of water sufficiently for this purpose.

**Enlarged Pictures** can be produced from small negatives by placing the negative between two glasses and enlarging in the lantern, throwing the picture on a sheet of sensitized paper and developing as described above. A picture  $3\frac{1}{4} \times 4\frac{1}{4}$  inches will bear enlargement up to  $15 \times 12$  inches, but not much more. This is a matter we only indicate.

**Transparencies for the Lantern.**—These may be taken on the Films, developing by either of the methods described, but in each case using a little more bromide of potassium. We think that for this purpose gelatine plates, as ordinarily prepared, are better than Films, as with the Films there is a slight opalescence, which is of no moment for printing on paper, but it would be a decided loss in the transparency for the lantern, which requires to be worked very clean and bright.

**Suggestions regarding the working of the 100-fold Camera.**—The experience of several workers with the instrument is, that they are able to do the changing of the Films by feeling alone, without using the sight. The sight is supplied so that the learning may be easy and certain.









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